REMARKS/ARGUMENTS

Claims 21-40 are pending. Claims 1-20 have been cancelled. No claims have been allowed.

Claim objections

Regarding the Examiner's objection to Claims 4, 8, 9, 12, 16, and 20 with respect to multiple dependency, Applicants have cancelled the foregoing claims and have submitted herewith new corresponding Claims 24, 28, 29, 32, 36, and 40 which do not include multiple dependency. Accordingly, Applicants respectfully request the Examiner to now consider new Claims 24, 28, 29, 32, 36, and 40 on the merits.

Responsive to the Examiner's objection regarding Claim 13, Applicants have cancelled same and have submitted new corresponding Claim 33, which depends from and further limits new Claim 26.

Specification

Responsive to the Examiner's objection regarding the Specification, Applicants have submitted a new paragraph herewith which paraphrases new Claims 21-23 and recites the claimed weight percentage of polyvalent ions and the claimed temperature ranges to thereby provide antecedent basis in the specification for same. Regarding the phrase "cold skull crucible", Applicants have not used same in the newly submitted claims. Applicants respectfully submit that no new matter has been added to the specification by the foregoing amendment.

Claim rejections – 35 U.S.C. § 112

Regarding the Examiner's rejection of Claims 1-3, 5-7, 10, 11, 13-15, and 17-19 under 35 U.S.C. §112, second paragraph, Applicants have submitted new Claims 21-40 herewith responsive to the Examiner's objections. In particular:

Claim 1 has been written with a preamble and recited method steps.

In Claims 25 and 30-33, the term "ion" has been changed to iron.

Regarding the phrase "high frequency energy" in the former Claims 7 and 18-20, Applicants have submitted herewith new corresponding Claims 27 and 38-40 which do not include the phrase "high frequency energy".

Claim rejections – 35 U.S.C. § 102

The Examiner rejected Claims 1, 5, 6, 13, and 17 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,856,497 to Hummel.

Hummel '497 discloses a method of making crystallized glass, including steps of melting and fining (refining) the glass. "[T]he melting and fining temperatures of the glass batches . . . are about 3100° F [1704° C]". (col. 4, lines 48-50). In Example 1, a glass batch was melted and fined at a temperature of about 3200° F (1760° C) to 2900° F (1593° C). In Examples 3-6, four glass batches were melted and fined in crucibles at temperatures from 2400° F (1315° C) to 3000° F (1649° C).

Independent Claim 21 calls for a process for producing a glass melt, including the steps of, *inter alia*, melting glass in a first stage, and refining the melt in a second stage, with at least one of said melting and refining steps conducted at a temperature of at least 1800° C.

Applicants respectfully submit that independent Claim 21 is not anticipated by Hummel '497 because Hummel '497 fails to disclose each and every element of independent Claim 21. Specifically, Hummel fails to disclose either melting or refining a glass melt at a temperature of at least 1800° C. By contrast, the highest temperature at which a glass melt is melted or refined in the process of Hummel '497 is at 3200° F (1760° C). Therefore, Applicants respectfully submit that independent Claim 21 is not anticipated by Hummel '497.

Further, because Claims 22-40 each depend from independent Claim 21, Applicants further submit that Claims 22-40 are also not anticipated by Hummel '497.

Claim rejections – 35 U.S.C. § 103

The Examiner rejected Claims 1-3, 7, 10, 11 and 13-17 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,082,528 to Lythgoe et al. The Examiner rejected Claims 7 and 18-19 under 35 U.S.C. §103(a) as being unpatentable over Lythgoe et al. '528 in view of Hummel '497 and further in view of U.S. Patent No. 4,780,121 to Metesa.

The disclosure of Hummel '497 is discussed above.

Lythgoe et al. '528 discloses a glass melting tank for melting glass, shown in the Figure, in which glass forming material 24 is fed into pocket 15 of melting zone 12, and is heated by gas burners 26. The molten glass 25 circulates by convection within melting zone 12, and a portion of same passes into refining zone 13. Refining zone 13 includes a layer of molten tin 19 at the bottom thereof, and a plurality of apertures 21 therebeneath in which

cooling air circulates. In this manner, heat is extracted from the molten glass within refining zone 13 through molten tin 19 and the cooling air to provide a temperature differential which sets up a convection current to maximize the flow of molten glass outwardly from refining zone into conditioning zone 14 and to minimize the flow of molten glass in a reverse direction. Specifically, the temperature of the molten glass within refining zone 13 is "at least 1460° C" (col. 2, lines 56-57), and the temperature differential between the molten glass at the top of refining zone 13 and at the bottom of refining zone 13 is about 200° C.

Matesa '121 discloses a process for the rapid induction heating of molten glass, wherein the temperature of molten glass is raised by induction heating "to about 2500° F. (1370° C.) or as high as bout 2800° F. (1540° C.)." (col. 6, lines 29-30).

Applicants respectfully submit that independent Claim 21 is not obvious over Lythgoe et al. '528 in view of Hummel '497 because each of the foregoing references, either alone or in combination, fails to disclose each and every element of independent Claim 21. Specifically, each of the foregoing references fails to disclose either melting or refining molten glass at a temperature of at least 1800° C. As discussed above, the highest temperature disclosed in Hummel '497 at which glass is either melted or refined is at 3200° F (1760° C).

Additionally, Lythgoe et al. '528 also fails to disclose melting or refining glass at a temperature of at least 1800° C. Although Lythgoe et al. '528 discloses that the temperature of molten glass in the upper portion of refining zone 13 may be "at least 1460° C" (*see* col. 2, lines 55-58), Applicants respectfully submit that one of ordinary skill in the art would not carry out such refining at temperatures of 1800° C and above, as called for in independent Claim 21. First, the detailed description of Lythgoe et al. '528 specifically states that "the temperature of the upper region of the glass in the refining zone is at about 1460° C in order to carry out satisfactory refining." (col. 4, lines 27-29).

Further, one of ordinary skill in the art would not increase the refining temperature substantially above 1460° C, because such would markedly decrease the thermal efficiency of the process. Specifically, increasing the refining temperature substantially above 1460° C would reduce the ability of the cooling air circulating through apertures 21 to remove heat from refining zone 13 through molten tin 19 in order to provide the necessary temperature

differential of 200° C between the molten glass in the upper and lower portions of refining zone 13. In this regard, Lythgoe et al. '528 specifically teaches that "the amount of heat required in the refining operation in accordance with the present invention is reduced due to the reduction of [the] quantity of glass in the return flow". (col. 3, lines 11-13). In other words, because the cooling apparatus at the bottom of refining zone 13 creates a temperature differential in the molten glass between the upper and lower portions refining zone 13, a thermally efficient convection flow is produced therein which enables a greater portion of the molten glass to flow forwardly into conditioning zone 14 than that which recirculates within refining zone 13 or flows backward into melting zone 12. In this manner, the overall thermal efficiency of the glass producing process is increased. In view of the foregoing, one of ordinary skill in the art would not conduct the refining step of the Lythgoe et al. '528 process at a temperature substantially above 1460° C, because same would make the process increasingly difficult to carry out in a thermally efficient manner.

For the foregoing reasons, Applicants respectfully submit that Lythgoe et al. '528 and Hummel '497, either alone or in combination, do not anticipate or render obvious Applicants' invention, as claimed in independent Claim 21. Further, because Claims 22-40 depend from independent Claim 21, Claims 22-40 are also not anticipated or obvious in view of Lythgoe et al. '528 and Hummel '497, either alone or in combination.

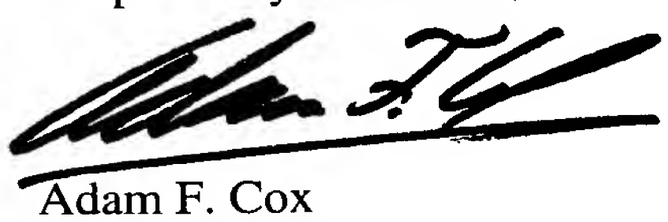
The Examiner's further citation of Matesa '121 cannot correct for the deficiencies of Lythgoe et al. '528 and Hummel '497, because Matesa '121 also fails to disclose a process for the production of glass melts in which a glass melt is either melted or refined at a temperature of at least 1800° C. Specifically, Matesa '121 discloses a process for the rapid induction heating of molten glass, wherein the temperature of molten glass is raised by induction heating "to about 2500° F. (1370° C.) or as high as bout 2800° F. (1540° C.)." (col. 6, lines 29-30).

It is believed that the above represents a complete onse to the Official Action and reconsideration is requested. Specifically, Applicants respectfully submit that the application is in condition for allowance and respectfully request allowance thereof.

In the event Applicants have overlooked the need for an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby petition therefore and authorize that any charges be made to Deposit Account No. 02-0385, Baker & Daniels.

Should the Examiner have any further questions regarding any of the foregoing, he is respectfully invited to telephone the undersigned at (260) 424-8000.

Respectfully submitted,



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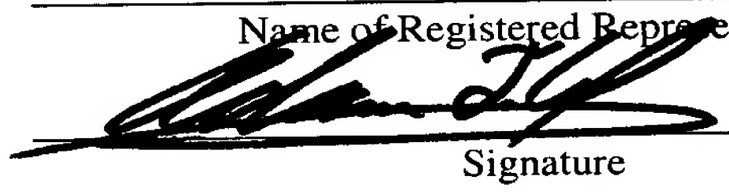

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Date